CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

ETE 102

COURSE OUTLINE

Course Information		ABET Unit Classification (4 Quarter Units)	
Department:	ETE	Math:	MAT 105
Course Number:	ETE 102/L	Basic Science:	
Course Title:	D-C Circuit Analysis / Laboratory	Engineering Topics:	4
Revision Date:	03/5/05	*Contains significant design content:*	No
Revised by:	Thomas Thoen	Other:	
Compliant:	Catalog 2004/05	Curriculum Designation:	Required

I. Catalog Description

ETE 102 DC Analysis / Laboratory (4)

Principles of electric circuit elements including resistance and DC network theorems. Capacitance, transients in RC circuits. 3 lectures/ problem-solving. 1 three-hour laboratory.

II. Prerequisites and Corequisites

MAT 105 or equivalent.

III. Textbook and/or other Required Material

Boylestad, Introductory Circuit Analysis, Prentice Hall, 10th ed., 2003.
http://vig.prenhall.com/catalog/academic/product/0,1144,013097417X,00.html

IV. Course Objectives

After completing this course the student will be able to:

1. Solve DC network problems with single and multiple voltage and current sources using nodal and superposition analysis.
2. Understand Thevenin and Norton equivalencies.
3. Use computer simulation tools to solve DC circuit problems.
4. Solve problems showing the relationship between charge and voltage in capacitors and current and voltage for inductors.
5. Perform experiments to validate lecture topics.
6. Compose professional and accurate laboratory reports.

V.Expanded Course Description

A. Expanded description of the course

1. Resistors – determining values and tolerances.
2. Ohm's law and Kirchhoff's Voltage and Current Laws. Multi-branch circuits, determining current and voltage values. Calculation of power in individual components.
3. Voltage and Current Divider Rules. Applications of voltage dividers.
4. Nodal Analysis.

5. Superposition Theorem using combinations of voltage and current sources. Determination of total current and power in individual components.
6. Thevenin's and Norton's Theorems and Maximum Power Transfer. Conversion of power sources.
7. Construction and DC Characteristics of Capacitors and Inductors

B. Typical Laboratory experiments:

1. Series DC Circuits
2. Parallel DC Circuits
3. Series-Parallel DC Circuits
4. Potentiometers
5. Thevenin's Equivalent and Maximum Power Transfer
6. Superposition
7. Effects of Meter Loading
8. Capacitors

VI. Class/Laboratory Schedule

3 sessions per week: Two 75-minute lectures and problem discussions. One 2 Hour 50 minute laboratory.

VII. Contribution of Course to Professional Component

Students learn to analyze DC networks with applied scientific principles. Students develop an understanding of the function of resistors and capacitors in a functioning circuit. Students learn to conduct an experiment using modern tools, collect data, analyze data, and write a report to professional standards. Students are required to perform computer analysis using modern software tools to validate calculations and experimental results.

VIII. Evaluation of Students

The instructor evaluates outcomes using the following methods:

- Homework assignment submittals
- Examinations
- One-on-one discussions during office hours

The student grades are typically based on the following factors:
quizzes, homework, midterm exams, lab assignments, final Exam

IX. Relationship of Course to Program Outcomes

Crse Obj	Program Outcomes										
	(a) **Use of modern tools of discipl**	***(b)*** **Use of math, science, Engg & Tech**	***(c)*** **Do experi -ments**	***(d)*** **Dsn of sys & compo nents**	***(e)*** **Work on teams**	***(f)*** **Do Tech probs**	***(g)*** **Eff Com**	***(h)*** **Life-long learn**	***(i)*** **Prof, ethics, social resps**	***(j)*** **Prof, soc, globl, diversity**	***(k)*** **Qual, Cont impr, timeli ness**
1		X				X					
2		X				X					
3	X	X				X					

4		X				X					
5	X	X	X		X	X					
6	X				X		X				